

## REMARKS

Reconsideration is respectfully requested.

The Examiner's rejections will be considered in the order of their occurrence in the Office Action.

### Part 1 of the Office Action

Claims 32 through 28 have been withdrawn (without prejudice) from consideration in this application.

### Part 2 of the Office Action

Claims 1 through 31 have been rejected under 35 U.S.C. §102(b) as being anticipated by Lahalih.

In general, the Lahalih reference teaches a method and composition that are primarily directed to increasing the load bearing capacity of the soil as well as the stabilization of the soil. This is pointed out in the Lahalih patent at a number of points in the disclosure, including col. 3, lines 56 through 59 ("An aqueous solution of this composition is sprayed onto the surface of the soil or mechanically admixed therewith to improve the load-bearing capacity of the treated soil."), col. 4, lines 14 through 18 ("a strong soil matrix... which can sustain greater loads"), col. 6, line 63 through col. 7, line 20 ("Compressive Strength Test"), and many of the Examples( set forth in cols. 8 et seq.) include measurement of the compressive strength of the soil.

Significantly, increasing the load bearing capacity of a soil, especially in a manner that increases the compaction or compressive strength of the soil, actually makes the soil less suitable for the growing of grasses (and other plants) because the increased compaction of the soil makes it more difficult, if not relatively impossible, for the grass plant to break through the surface of the

soil and to develop a root structure in the soil because the soil is compacted so hard. Thus, while practice of the Lahalih method using the composition disclosed therein may help to stabilize soil to which it is applied, it is at the cost of inhibiting plant growth because the compaction of the soil is also increased.

However, increasing the compaction of the soil as taught by Lahalih is directly in conflict with one of the primary purposes of the method of the claimed invention, which is to provide a suitable soil character for growing plant life to stabilize the soil once the effect of the polyacrylamide has dissipated from the soil. The application of polyacrylamide according to the claimed method has effects that are dissipated over time, and if a healthy plant base is not established in the soil, the soil will again become vulnerable to erosion. The Lahalih disclosure is directed to stabilizing soil through increasing the soil compaction, but at the apparent expense of hampering the growth of plants in the soil.

Further, it is submitted that the teaching of the Lahalih patent would actually lead one away from the use of polyacrylamide for application to soil. Firstly, the Lahalih patent teaches (at col. 2, lines 6 through 8) that polyacrylamide is relatively expensive:

First, some [soil conditioners] are expensive and are not economical to use (e.g., polyacrylamide...

Thus, the Lahalih patent teaches one skilled in the art that the use of polyacrylamide is too expensive, at least compared to the composition disclosed in the Lahalih patent.

Secondly, rather than increasing the compaction or compressive strength of the soil to which it is applied (as advocated by Lahalih), polyacrylamide applied in the manner of the method of the claimed invention actually has the tendency to *loosen* the

compaction of the soil. For example, see the applicant's specification at page 17, lines 17 through 25, where it states:

In the event of a compacted crust, a preliminarily misting of the mixture onto the top surface of the soil is highly beneficial to loosen the compaction of the soil for enhancing the penetration and flocculation of subsequent applications of the mixture into the soil. Thus, the initial misting of the mixture on the top surface of the soil tends to loosen the crust for permitting faster and easier penetration of the subsequent applications of the mixture into the soil.

Thus, it is submitted that one skilled in the art, considering the Lahalih patent and its purpose of increasing the load-bearing capacity of soil by increasing its compaction, would not be led to the application of polyacrylamide to soil because of the effect of the polyacrylamide on the soil.

It is therefore submitted that the Lahalih patent would not lead one of ordinary skill in the art to applicant's claim 1 and claim 17 requirements of "establishing a uniform mixture ratio for a mixture of PAM and water", "mixing PAM with water according to the uniform mixture ratio" and "applying the mixture to a top surface of soil of the land area". Further, it is submitted that the Lahalih disclosure could not lead one of ordinary skill in the art to the ratios of PAM to water set forth in claims 2 and 3 and 30.

Still further, the Lahalih patent merely refers to "mechanical mixing" of the composition with soil, or "top soil spraying" of the composition, as techniques for applying the composition to soil, but does not provide any further guidance as to the techniques of application of the composition to the soil. In particular, the Lahalih patent lacks any disclosure which would lead one to the step of "terminating the application of the mixture when PAM reaches sufficient depth penetration below a top surface of the soil", as required by applicant's claim 1, or any of the more specific

application steps set forth in claims 4 through 16, and 18 through 29 and 31.

It is therefore submitted that the Lahalih reference, relied upon in the rejection of the Office Action, would not lead one skilled in the art to the applicant's invention as required by claims 1 through 31.

Withdrawal of the §102(b) rejection of claims 1 through 31 is therefore respectfully requested.

#### **Part 4 of the Office Action**

Claims 1 through 31 have been rejected under 35 U.S.C. §102(b) as being anticipated by Leshchiner et al.

The Leshchiner et al. patent teaches a gel slurry which may include polyacrylamide, but the Leshchiner patent only discloses use of the gel slurry in the human body, through, for example, injection into the body, and does not disclose any of the mixing or application steps set forth in claims 1 through 31.

It is therefore submitted that the Leshchiner et al. reference, relied upon in the rejection of the Office Action, would not lead one skilled in the art to the applicant's invention as required by claims 1 through 31.

Withdrawal of the §102(b) rejection of claims 1 through 31 is therefore respectfully requested.

#### **Part 5 of the Office Action**

Claims 1 through 31 have been rejected under 35 U.S.C. §102(b) as being anticipated by Cenisio et al.

Claim 1, particularly as amended, requires

The Cenisio et al reference teaches polyacrylamide as a stabilizer for a treatment for sizing cellulose fibers and wood chips, but lacks any teaching of the application of polyacrylamide to soil or any method of applying polyacrylamide to soil.

It is therefore submitted that the Ceniso et al. reference, relied upon in the rejection of the Office Action, would not lead one skilled in the art to the applicant's invention as required by claims 1 through 31.

Withdrawal of the §102(b) rejection of claims 1 through 31 is therefore respectfully requested.

It is therefore submitted that the patent references identified in the rejections of the Office Action would not lead one skilled in the art to the invention as set forth in the requirements of claims 1 through 31 of the Office Action.

**VERSION WITH MARKINGS TO SHOW CHANGES MADE:**

**In the Claims** (bracketed parts deleted and underline parts added):

1. (Pending) A method of applying polyacrylamide (PAM) for stabilizing soil particles of a land area from erosive movement about the land area, the method comprising;  
establishing a uniform mixture ratio for a mixture of PAM and water to be applied to a land area;  
calculating a total application rate for applying the mixture to the land area;  
mixing PAM with water according to the uniform mixture ratio to form a mixture for application to the land area;  
applying the mixture to a top surface of soil of the land area; and  
terminating the application of the mixture when PAM reaches sufficient depth penetration below a top surface of the soil.

2. (Pending) The method of claim 1 wherein the establishing step includes mixing PAM and water in a ratio of about 1 part PAM to between about 500 and about 5000 parts water by volume.

3. (Pending) The method of claim 1 wherein the establishing step includes mixing PAM and water in a ratio of 1 part PAM to about 1000 parts water by volume.

4. (Pending) The method of claim 1 additionally comprising the step of determining a number of times that the mixture of the uniform mixture ratio needs to be applied to the land area to achieve the calculated total application rate of the PAM.

5. (Pending) The method of claim 1 wherein the applying step comprises making a series of applications of the mixture to the surface for a number of times until the application rate for the soil

of the land area is achieved.

6. (Pending) The method of claim 1 wherein the applying step includes misting a portion of the total application rate of the mixture onto the surface of the land area to produce a tack coat for initially stabilizing topmost soil particles on the top surface of the land area against soil particle movement caused by subsequent mixture applications.

7. (Pending) The method of claim 1 wherein the applying step includes continuing to apply the mixture to the surface of the soil until the soil of the land area becomes saturated and stopping the application of the mixture top surface becomes saturated.

8. (Pending) The method of claim 7 additionally comprising detecting saturation of the soil when the mixture appears to be accumulating on the surface rather than being relatively quickly absorbed into the ground and the mixture on the top surface appears to reflect ambient light.

9. (Pending) The method of claim 8 wherein the applying step includes waiting for a time period after detection of saturation such that the mixture is able to penetrate the ground below the surface, wherein the time period comprises the time required for any puddles of the mixture on the top surface of the soil to be absorbed into the soil below the top surface.

10. (Pending) The method of claim 9 wherein the waiting step is conducted for a time period that is less than the time required for the top surface of the soil to dry.

11. (Pending) The method of claim 1 wherein the applying step includes the step of directing a spray of the mixture onto the

top surface of the soil of the land area from at least four directions, each of the directions being oriented at about 90 degrees to at least two of the other directions.

12. (Pending) The method of claim 11 wherein the applying step includes the step of directing a spray of the mixture at a substantially perpendicular angle downward onto the top surface of the soil of the land area, wherein the direction of the substantially perpendicular spray varies less than about 15 degrees measured from an axis perpendicular to the surface of the soil.

13. (Pending) The method of claim 1 additionally comprising testing the extent of penetration of the PAM below the top surface of the soil of the land area.

14. (Amended) The method of claim 1 wherein the testing step includes removing a core sample of the soil from the land area [;] .

15. (Pending) The method of claim 1 additionally comprising the step of comparing the depth penetration of the PAM below the top surface of the soil of the land area to a set of minimum depth penetration values based upon the general slope of the land area to determine the minimum depth penetration needed for the land area being treated before terminating application of the mixture to the land area;

wherein if the general slope of the land area is between substantially level and a general slope of 4 to 1, inclusive, the sufficient depth penetration is a minimum of about 1.3 inches;

wherein if the general slope of the land area is about 3 to 1, the sufficient depth penetration is a minimum of about 1.5 inches;

wherein if the general slope of the land area is about 2 to 1,

the sufficient depth penetration is a minimum of about 2 inches;

wherein if the general slope of the land area is about 1.5 to 1, the sufficient depth penetration is a minimum of about 2.5 inches; and

wherein if the general slope of the land area is about 1 to 1 or steeper, the sufficient depth penetration is a minimum of about 3 inches.

16. (Pending) The method of claim 15 additionally comprising exceeding the total application rate calculated if the sufficient minimum depth penetration is not achieved through application of mixture to the soil at the total application rate.

17. (Pending) A method of applying polyacrylamide (PAM) for stabilizing soil particles of a land area from erosive movement about the land area, the method comprising;  
establishing a uniform mixture ratio for a mixture of PAM and water to be applied to a land area;  
calculating a total application rate for applying the mixture to the land area;  
mixing PAM with water according to the uniform mixture ratio to form a mixture for application to the land area; and  
applying the mixture to a top surface of soil of the land area by misting a top surface of the land area with the mixture for producing a tack coat of the PAM for initially stabilizing topmost soil particles on the top surface of the land area against soil particle movement caused by any subsequent mixture applications.

18. (Pending) The method of claim 17 additionally comprising the step of determining a number of times that the mixture of the uniform mixture ratio needs to be applied to the land area to achieve

the calculated total application rate of the PAM.

19. (Pending) The method of claim 18 wherein the applying step comprises making a series of applications of the mixture to the soil according to the number of times determined to achieving the total application rate for the soil of the land area using the is achieved.

20. (Pending) The method of claim 17 wherein the applying step includes continuing to apply the mixture to the surface of the soil until the soil of the land area becomes saturated and stopping the application of the mixture top surface becomes saturated.

21. (Pending) The method of claim 20 additionally comprising detecting saturation of the soil when the mixture appears to be accumulating on the surface rather than being relatively quickly absorbed into the ground and the mixture on the top surface appears to reflect ambient light.

22. (Pending) The method of claim 21 wherein the applying step includes waiting for a time period after detection of saturation such that the mixture is able to penetrate the ground below the surface, wherein the time period comprises the time required for any puddles of the mixture on the top surface of the soil to be absorbed into the soil below the top surface.

23. (Pending) The method of claim 22 wherein the waiting step is conducted for a time period that is less than the time required for the top surface of the soil to dry.

24. (Pending) The method of claim 17 wherein the applying step includes the step of directing a spray of the mixture onto the top surface of the soil of the land area from at least four directions,

each of the directions being oriented at about 90 degrees to at least two of the other directions.

25. (Pending) The method of claim 17 wherein the applying step includes the step of directing a spray of the mixture at a substantially perpendicular angle downward onto the top surface of the soil of the land area, wherein the direction of the substantially perpendicular spray varies less than about 15 degrees measured from an axis perpendicular to the surface of the soil.

26. (Pending) The method of claim 17 additionally comprising testing the extent of penetration of the PAM below the top surface of the soil of the land area.

27. (Amended) The method of claim 17 wherein the testing step includes removing a core sample of the soil from the land area[;] .

28. (Pending) The method of claim 17 additionally comprising the step of terminating the application of the mixture when PAM reaches sufficient depth penetration below a top surface of the soil.

29. (Pending) The method of claim 28 additionally comprising comparing the depth penetration of the PAM below the top surface of the soil of the land area to a set of minimum depth penetration values based upon the general slope of the land area to determine the minimum depth penetration needed for the land area being treated before terminating application of the mixture to the land area;

wherein if the general slope of the land area is between substantially level and a general slope of 4 to 1, inclusive, the sufficient depth penetration is a minimum of about 1.3 inches;

wherein if the general slope of the land area is about 3 to 1,

the sufficient depth penetration is a minimum of about 1.5 inches;

wherein if the general slope of the land area is about 2 to 1,  
the sufficient depth penetration is a minimum of about 2 inches;

wherein if the general slope of the land area is about 1.5 to 1,  
the sufficient depth penetration is a minimum of about 2.5 inches;  
and

wherein if the general slope of the land area is about 1 to 1 or  
steeper, the sufficient depth penetration is a minimum of about 3  
inches.

30. (Pending) The method of claim 17 wherein the  
establishing step includes mixing PAM and water in a ratio of about  
1 part PAM to between about 500 and about 5000 parts water by  
volume.

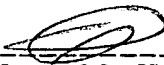
31. (Pending) The method of claim 17 additionally comprising  
the step of considering the relative compaction of the soil of the  
land area, and increasing a number of times of applications of the  
mixture if the top surface of the soil of the land area has a  
compacted crust for loosening the compaction of the soil to enhance  
the penetration of subsequent applications of the mixture into the  
soil.

Please withdraw claims 32 through 38 without prejudice.

### CONCLUSION

In light of the foregoing amendments and remarks, early reconsideration and allowance of this application are most courteously solicited.

Respectfully submitted,

  
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